

Interesting variations of the strawberry leaf.—The strawberry, both wild and cultivated, is perhaps considered less inclined to variation of foliage than many of our common plants. I have often sought in vain among them for an abnormal leaf. There are so many strawberry leaves in which the lower portion of the two lateral leaflets is conspicuously enlarged, that one is led to expect the advent of additional leaflets. In other words it sometimes appears as if nature were planning to inaugurate a five-leaved form. There is often apparently overgrowth sufficient to form an extra leaflet. Indeed the lateral leaflets become so lopsided, on account of this excessive growth, that symmetry demands that the lower portion be cut off and made into a separate leaflet. Plants all about us are moulding their leaves in accordance with changing conditions. They have found by long experience in the struggle for life, that, oftentimes, many small leaves serve their purpose better than a less number of larger ones. And so we find many entire leaves indenting their margins; lobed ones becoming more deeply lobed; still others, by what we may term an evolutionary process of division, give rise to new or additional leaflets. From the lateral leaflets of the strawberry, for instance, other leaflets might be expected to be evolved or developed.

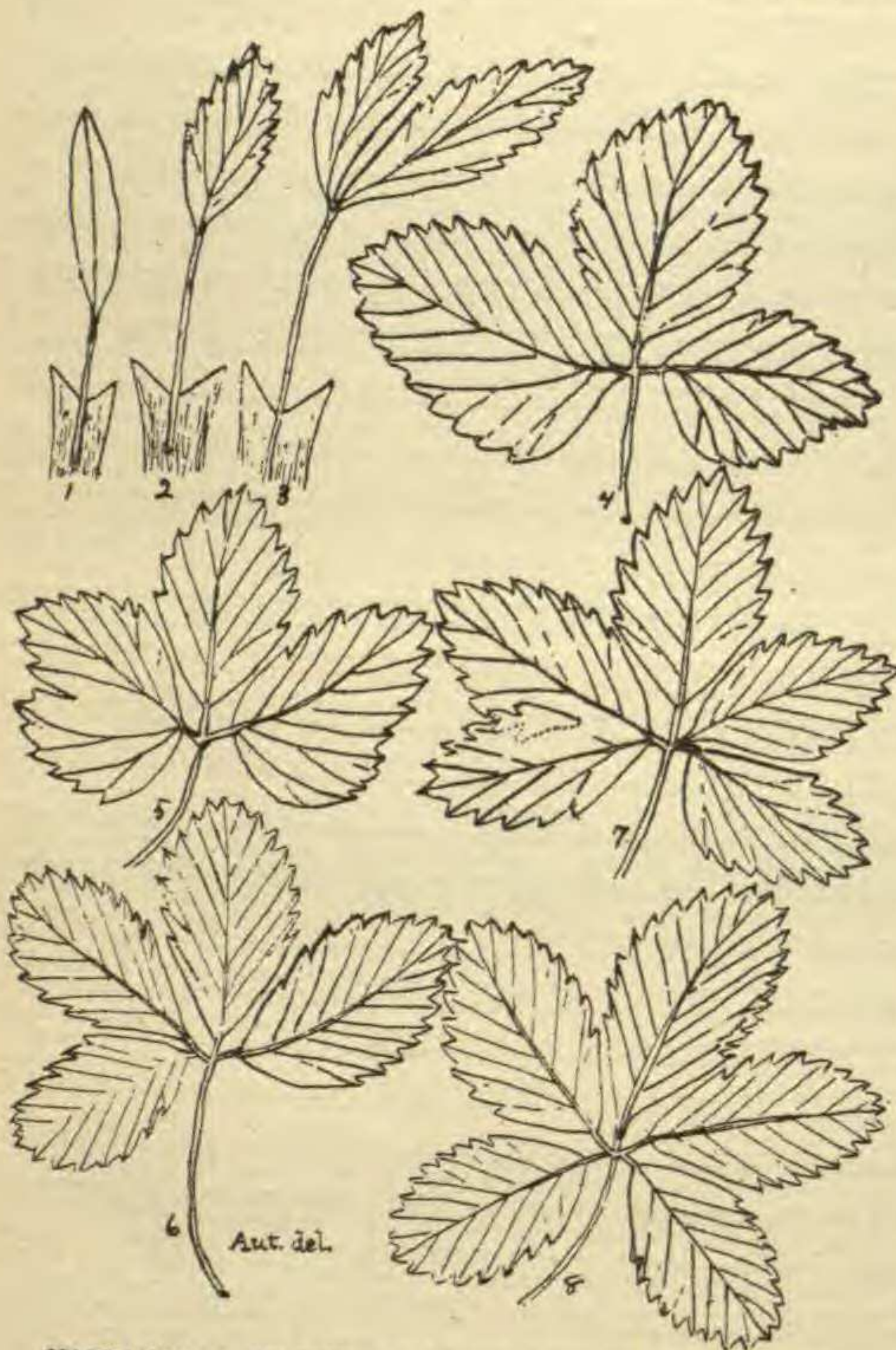
This process may be observed in very many of our common plants; it was therefore with much pleasure that the conservative strawberry was, this past season, found falling into line with other progressive plants. In a small strawberry patch some thirty or forty large, vigorous, thrifty looking leaves were found which had progressed beyond the present trifoliate form. The new or added leaflets appear, just where I had hoped to find them, on the lower side of the lateral leaflets, where the surplus growth seems to have been made in anticipation of such a forward step. Figs. 5, 6, 7 and 8 (reduced one-half) represent a series of these leaves. Many more gradations might be shown were there space sufficient. But these will serve to illustrate that the strawberry is not standing still; that it is moving along the same lines traversed by the blackberry, the Virginia creeper, etc.

The finding of these "abnormal" leaves, brought to mind some interesting leaves of *Fragaria Virginiana*, var. *Illinoensis*, which were collected near Lexington, Ky., some ten years ago. Figs. 1, 2 and 3, (half natural size) represent gradations of these suggestive leaves. Duplicates were sent to Dr. Gray at the time, but he considered them "merely abnormal forms, which sometimes occur."

Is it not possible, however that the single leaf, fig. 1, is the primitive or ancestral type of our present trifoliate form? Evolution carried this type to the plane upon which we find fig. 2, in which the crenate-



dentate margin has been added; larger, stronger veins have been formed and it is really become a strawberry leaf. Did not this single leaf-



VARIATIONS OF THE LEAF OF THE STRAWBERRY.

too prosperous to remain in the humble household.

But the leaves tell their own story so simply and so well that one needs but to give ear unto it in order to understand the progressive steps from the primitive leaf up to the possibilities of the future represented by fig. 8.—MRS. W. A. KELLERMAN, *Columbus, Ohio*.

On the development of the embryo-sac of *Arisæma triphyllum*. (WITH PLATE XVIII.)—The origin of the angiosperms and the true relationship between monocotyledons and dicotyledons are among the problems now demanding the attention of the botanists. From our present knowledge the monocotyledons may be regarded as the more primitive group from which the dicotyledons have been derived, or the dicotyledons may be looked upon as the primitive group, and the monocotyledons as degenerate forms derived from them. It seems highly probable, however, that one or the other is the correct view;

let, in the sometime of the past, give off the two lateral leaflets, making it trifoliate? Does not fig. 3, give us an affirmative answer to our question? The transition forms (figs. 5, 6, 7,) have followed the same law in the development of these added leaves, which was suggested in the development of the trifoliate from the ancestral type. Descriptions of leaves ordinarily cover but the golden mean. Fig. 4 is the only one which is recognized as having a legitimate place among the leaves of the strawberry. The others are either "poor relations" which should remain in the background, or are